

Claims

1. An arrangement for controlling transmitting power of an antenna in a radio device, which antenna comprises a first radiating element to provide a lower operating band, and a second radiating element to provide an upper operating band,
 5 and which arrangement comprises
 - a first power amplifier for feeding the antenna with a signal of the lower operating band,
 - a second power amplifier for feeding the antenna with a signal of the upper operating band,
 - 10 - an antenna switch for connecting the antenna to a transmitter or receiver part according to the phase of operation of the radio device,
 - measurement elements for measuring the strength of the field propagating to the antenna both in the lower and in the upper operating band,
 - a detector for converting a radio-frequency measurement result into a low-
 15 frequency signal indicating the transmitting power, and
 - a power control unit for controlling the feeding power amplifier on the basis of the signal indicating the transmitting power,
 wherein
 - there is an electromagnetic coupling between the first and the second radiating
 20 elements,
 - the antenna switch has a first part with which the first radiating element can be connected to the first power amplifier or the detector, and a second part with which the second radiating element can be connected to the second power amplifier or the detector,
 - 25 - said measurement elements for measuring the transmitting power of the antenna in the lower operating band substantially comprise the second radiating element, and
 - said measurement elements for measuring the transmitting power of the antenna in the upper operating band substantially comprise the first radiating element.
2. An arrangement according to claim 1, the first and the second radiating
 30 elements being galvanically isolated from each other.
3. An arrangement according to claim 1, the first and the second radiating elements being planar elements in substantially the same geometric plane, the antenna comprising a unitary ground plane parallel to the planar elements, and the first and the second radiating elements being short-circuited to the ground plane.

4. An arrangement according to claim 2, the first and the second planar radiating elements being both separately short-circuited to the ground plane so that the antenna has a dual-PIFA structure.
5. An arrangement according to claim 3, between the first and the second planar radiating elements being, in addition to said electromagnetic coupling, a galvanic coupling, and said short-circuiting of the second radiating element to the ground plane taking place in that area of the plane where said galvanic coupling is.
6. An arrangement according to claim 5, the first and the second radiating elements being short-circuited to the ground plane by a single short-circuit conductor.
7. An arrangement according to claim 5, the first and the second planar radiating elements being connected to the ground plane at two separate short-circuit points by two short-circuit conductors.
8. An arrangement according to claim 1, wherein, to control the feeding power amplifier on the basis of the signal indicating the transmitting power, said power control unit comprises means for comparing the level of the measurement signal indicating the transmitting power against a certain reference level and for conveying a result of the comparison to the power amplifier.
9. An arrangement according to claim 8, said means being programmable.
10. A method for controlling the transmitting power of an antenna in a radio device using time-division duplex technology, which antenna comprises at least two radiating elements, one for providing a lower operating band and the other for providing an upper operating band, and the radio device further comprises a power amplifier for feeding the antenna with a signal of the lower operating band and a second power amplifier for feeding the antenna with a signal of the upper operating band, the method comprising steps;
 - the currently feeding power amplifier is connected to the antenna,
 - the strength of field propagating from the feeding power amplifier to the antenna is measured by a measurement element,
 - the radio-frequency measurement result is detected by a detector,
 - the detection result obtained is compared to a certain reference level,
 - the feeding power amplifier is controlled on the basis of the result of the comparison so that the detection result is kept equal with the reference level,

wherein there is an electromagnetic coupling between said radiating elements, and in the method

- the feeding power amplifier is connected to the radiating element with frequency-band corresponding to the power amplifier at issue, or to feeding element, and

5 - an other radiating element with respect to the feeding element is connected to said detector,

- said other radiating element serving as a measurement element for the strength of the field propagating from the feeding power amplifier to the antenna, by means of said electromagnetic coupling.

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11. An arrangement according to claim 3, the first and the second planar radiating element being both separately short-circuited to the ground plane so that the antenna has a dual-PIFA structure.